season in that area. The Weather Bureau office, Portland, Oreg., reports as follows:

The month was the driest November of record at Portland, Oreg., and from reports this condition was general over the entire Northwest. It is thought that the period July to November 1929 was slightly drier than for the same period this year.

The stages of the Columbia River and its tributaries were very low at the end of November. Except in one or two instances, the monthly averages were slightly above those in 1929 as shown in following table:

Station	Number of years record	November average	November 1929 average	November 1936 average
Albany, Oreg.	42	4.1	0.5	0.4
Bonners Ferry, Idaho	31	1.6	−.9	−.8
Eugene, Oreg.	35	2.7	−1.8	−2.3
Eula, Oreg.	13	2.8	1.6	1.1
Jefferson, Oreg.	30	3.4	.6	−.3
Lewiston, Idaho	32	2.3	1.9	[1] 1.0
Kelso, Wash.	13	5.4	2.7	2.8
Mehama, Oreg.	14	3.3	1.4	1.5
Oregon City, Oreg.	25	4.7	1.3	2.6
Salem, Oreg.	36	3.0	[2]−2.7	[2]−4.1
The Dalles, Oreg.	39	3.4		−1.5
Umatilla, Oreg.	39	2.9		.6
Vancouver, Wash.	32	2.9	.1	−.1
Waterloo, Oreg.	14	4.0	2.0	2.1
Weiser, Idaho	29	4.1	[3] 4.4	[3] 3.4
Portland, Oreg.	58	3.9	.7	.8

[1] 0.9 foot in 1931 and 1934.
[2] Low stages recent years due to dredging.
[3] 2.9 feet in 1931 and 1934.

Table of flood stages during November 1936

[All dates in November unless otherwise specified]

River and station	Flood stage	Above flood stages—dates From—	Above flood stages—dates To—	Crest Stage	Crest Date
ST. LAWRENCE DRAINAGE					
Lake Erie					
St. Joseph:	*Feet*			*Feet*	
Fort Wayne, Ind.	12	4	4	12.0	4
Montpelier, Ohio	10	5	5	10.0	5
ATLANTIC SLOPE DRAINAGE	*Feet*			*Feet*	
Santee:		Oct. 2	2	17.6	Oct. 22
		4	8	13.1	7
Rimini, S. C.	12	12	16	13.3	15
		18	22	12.9	22
		25	[1]	12.8	27
		Oct. 5	9	14.0	Oct. 23, 24
Ferguson, S. C.	12	13	17	12.5	16
		19	23	12.5	22
		26	[1]	12.4	29
MISSISSIPPI SYSTEM					
Missouri Basin					
Osage: Osceola, Mo.	20	4	4	20.6	4
Ohio Basin					
Kiskiminetas: Saltsburg, Pa.	8	5	5	10.5	5
West Fork of White:					
Anderson, Ind.	8	3	3	8.2	3
Elliston, Ind.	18	4	8	22.2	7
Edwardsport, Ind.	12	4	10	17.6	8, 9
East Fork of White: Seymour, Ind.	14	4	7	16.4	6
White:					
Petersburg, Ind.	16	8	11	17.3	11
Hazleton, Ind.	16	8	13	17.6	11
Wabash:					
La Fayette, Ind.	11	3	8	19.7	4
Covington, Ind.	16	3	9	23.2	6
Terre Haute, Ind.	14	4	12	18.2	9
Vincennes, Ind.	14			13.7	13
White Basin					
Black: Black Rock, Ark.	14	3	3	14.2	3
Arkansas Basin					
Petit Jean: Danville, Ark.	20	4	5	20.3	5
Lower Mississippi Basin					
St. Francis:					
Fisk, Mo.	20	4	8	23.3	6
St. Francis, Ark.	18	10	13	19.1	12

[1] Continued into December.

WEATHER ON THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, I. R. TANNEHILL in charge]

NORTH ATLANTIC OCEAN, NOVEMBER 1936

By H. C. HUNTER

Atmospheric pressure.—The average pressure for November shows substantially the same contrasts with the normal that were displayed during the preceding month. Averages lower than normal were indicated for north-central and northeastern portions, while over and for a considerable distance around the Azores, pressure exceeded the normal, the average at Horta having a positive departure of practically a fifth of an inch.

The extremes of pressure found in vessel reports are 30.64 and 28.34 inches. The higher of these readings was noted on the American steamship *Dryden*, at 11 a. m., the 30th, at latitude 45°48′ N., longitude 18° W. The lower mark was recorded on the Danish steamship *Kentucky*, at 10 a. m., the 12th, at 53°30′ N., 39°10′ W.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, November 1936*

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Julianehaab, Greenland	29.44	−0.12	30.04	11, 30	28.34	17
Reykjavik, Iceland	29.55	−.07	30.27	24	28.68	19
Lerwick, Shetland Islands	29.69	−.01	30.48	22	28.79	8
Valencia, Ireland	29.91	+.02	30.51	20, 21	28.55	7
Lisbon, Portugal	30.10	+.06	30.42	14	29.71	25
Madeira	30.08	+.07	30.33	11, 14, 15	29.77	19, 25, 26
Horta, Azores	30.32	+.19	30.48	2	29.92	27
Belle Isle, Newfoundland	29.81	+.04	30.64	3	28.76	17
Halifax, Nova Scotia	29.91	−.04	30.56	6	29.20	16
Nantucket	30.01	−.04	30.61	6	29.33	15
Hatteras	30.11	.00	30.49	11	29.58	15
Bermuda	30.11	+.03	30.38	2	29.68	16
Turks Island	29.98	−.01	30.08	28	29.84	4
Key West	30.04	+.02	30.32	28	29.83	5
New Orleans	30.19	+.09	30.48	27	29.89	30

NOTE.—All data based on a. m. observations only, with departures compiled from best available normals related to time of observation, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour corrected means.

Cyclones and gales.—The month was marked by numerous strong gales over North Atlantic waters, particularly to the eastward of the thirty-fifth meridian. The stormiest period was the 5th to 12th. At this time unusually strong gradients were the rule between high pressure in the region around the Azores and Madeira, and low pressure in the northeastern area embracing the British Isles, Iceland, and waters between.

The first few days of the month saw considerable storminess. About 300 miles east-northeast of Newfoundland the Swedish motorship *Blankaholm* encountered force-12 wind on the 1st, while the Swedish steamship *Braheholm* met a wind of like strength on the 5th when approximately 300 miles southeast of the southern tip of Greenland. The latter occurrence was connected with a LOW which was centered just west of Iceland on the 2d, and moved irregularly but mainly southeastward, till it reached northern Ireland and western Scotland, where it was almost stationary from the 6th to the 9th, thereafter moving away toward the northeast. During this long period its intensity varied considerably, but at times was very marked. As a result of this storm the German motorship *Isis* sank during the night of the 8–9th, when near latitude 50° N., longitude 11° W. Only one cabin boy was saved of the crew of about 35 on board.

Quickly following this storm, a LOW which had displayed only moderate strength to westward of mid-Atlantic, intensified decidedly during the 10th and 11th and greatly affected waters within moderate distances west of Ireland and around the British Isles until the center reached the North Sea on the 13th. The British motorship *Sylvafield* on the 12th, in the English Channel, noted wind of force 12 in connection with this storm.

About the same time a rapidly developing storm affected the east coast of the United States, the center moving from the eastern Gulf of Mexico on the morning of the 12th to the vicinity of Cape Race on the 14th. During the night of the 12–13th, the American steamship *Siboney,* when near Hatteras, noted force–12 wind. The conditions on the morning of the 13th are displayed on chart IX.

On the morning of the 14th a LOW of large area was central near the southern end of Hudson Bay; it advanced first toward the southeast, then toward the northeast, and on the morning of the 17th was centered near Cape Farewell, with pressure below 28.40 inches. A long southward extension of the LOW had developed as it approached the eastern coast of the continent, and this, too, had become quite intense. A few steamers were crippled in their encounter with the high seas at this time, the British steamship *Sheaf Spear* being near Bermuda when it suffered injury, and presently making harbor there. Considerably farther to the northward, on the British motorship *Tweedbank,* the captain was swept against a winch, suffering fatal injury, and one sailor was washed overboard and lost.

By the 22d a later storm from the northern interior of the North American continent had come near the eastern coast, and on the morning of the 23d was centered near the Gulf of St. Lawrence, with marked energy, having united with a storm which traveled north-northeastward near the coast line. (See chart X.) This storm also took a northeastward course toward southern Greenland, and soon ceased to have important effects along the chief steamship routes.

In general, the eastern and central portions of the North Atlantic had but little stormy weather during the final fortnight of November, and, indeed, the last 6 days were almost without reports of gales anywhere over the North Atlantic Ocean.

Fog.—During November 1936 fog was of comparatively infrequent occurrence over the North Atlantic, as is expected during the late autumn. In nearly all the 5°-squares reports indicate fewer fogs than there had been in October just preceding.

To eastward of the thirtieth meridian about the only dates when fog was met were from the 16th to 19th, and no single area had fog then on more than 2 days. The square, including part of southeastern Newfoundland, namely, 45° to 50° N., 50° to 55° W., had reports of fog on 8 days, leading all other like areas in frequency. Here and elsewhere over and near the Grand Banks the final 5 days of the month brought most of the fog.

In the Gulf of Mexico the first fog report since spring indicated fog in a small part of the northwestern Gulf on the 20th.